

# High Pressure Atmospheric Sampling Inlet System for Venus or the Gas Giants, Phase I

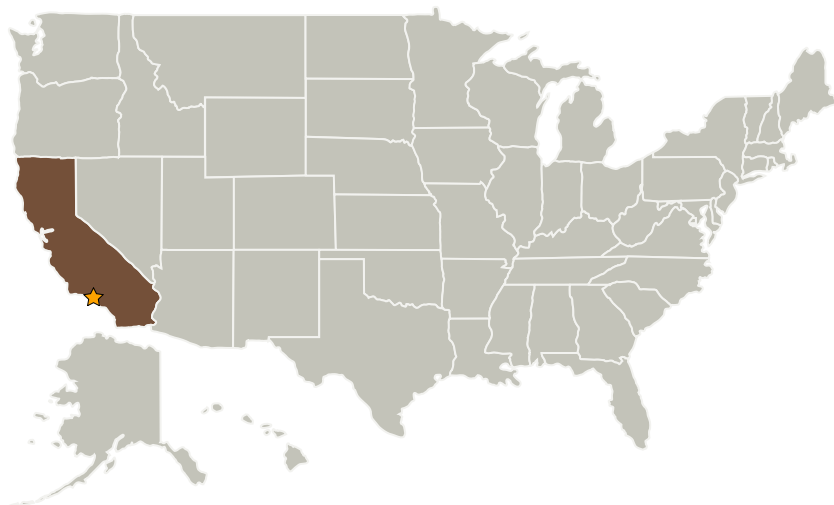
Completed Technology Project (2004 - 2004)



## Project Introduction

Thorleaf Research, Inc. proposes to develop a miniaturized high pressure atmospheric sampling inlet system for sample acquisition in extreme planetary environments, such as those encountered in the lower troposphere of Venus or the atmospheres of the gas giants, Jupiter, Saturn, Uranus and Neptune. This addresses a key technology gap for planetary studies, mainly how to acquire and prepare samples for in situ analysis while meeting challenging mass, volume and power constraints. Although miniaturized mass spectrometers and other low power instruments are under development by NASA for in situ measurements, the great potential of such instrumentation for exploration of the Solar System will not be realized without complementary developments in the technology for collecting and preparing samples for analysis. Our proposed approach collects an atmospheric gas micro-sample at high pressure and transfers it into a protected low pressure environment within a small pressure housing for analysis by GC/MS, mass spectrometry or other techniques that inherently require low pressures for operation. This new technology will enable in situ measurement of the composition and key isotope ratios in high pressure planetary atmospheres down to trace levels.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Thorleaf Research, Inc.	Supporting Organization	Industry	Santa Barbara, California

## Primary U.S. Work Locations

California

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Paul M Holland

## Technology Areas

**Primary:**

- TX04 Robotic Systems
  - └ TX04.3 Manipulation
    - └ TX04.3.4 Sample Acquisition and Handling